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*Form Approved
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1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 21 August 1995	3. REPORT TYPE AND DATES COVERED Final
4. TITLE AND SUBTITLE Environmental Assessment, Project Number P-994 Seawall (Shoreline Protection), Fleet Combat Training Center, Atlantic		5. FUNDING NUMBERS PR Project Number P-994
6. AUTHOR(S) James D. Haluska, LANTNAVFACENGCOM		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Commander LANTNAVFACENGCOM 1510 Gilbert Street Attn: Code 2032JH Norfolk, VA 23511-2699		8. PERFORMING ORGANIZATION REPORT NUMBER None
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Fleet Combat Training Center Atlantic 1912 Regulus Avenue Virginia Beach, Virginia 23461-2098		10. SPONSORING / MONITORING AGENCY REPORT NUMBER None
11. SUPPLEMENTARY NOTES Finding of No Significant Impact (FONSI) signed by CNO on 4 August 1995		
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC DISTRIBUTION; DISTRIBUTION IS UNLIMITED		12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) <p>An Environmental Assessment (EA) was prepared describing the potential environmental impact of a stone core/sand dune/beach nourishment system proposed for the Atlantic shore at the Fleet Combat Training Center Atlantic at Dam Neck, Virginia Beach, Virginia. Areas of probable impact are the beach to be filled with sand, the offshore borrow area, the routes for construction equipment, and effects on sea turtles and whales. Based on the EA, a Finding of No Significant Impact was issued by the Navy. This EA was prepared as required by the National Environmental Policy Act (NEPA).</p>		
14. SUBJECT TERMS NEPA, Seawall, Dune Reconstruction, Beach Nourishment, Environmental Impact, Environmental Assessment		15. NUMBER OF PAGES 55
		16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified
20. LIMITATION OF ABSTRACT		

DTIC QUALITY INSPECTED 4

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**Fleet Combat Training Center, Atlantic
1912 Regulus Avenue
Virginia Beach, Virginia 23461-2098**

**ENVIRONMENTAL ASSESSMENT
PROJECT NUMBER P-994
Seawall (Shoreline Protection)
Fleet Combat Training Center, Atlantic**

July 1995

**Consistent with the National Environmental Policy Act of 1969 as amended,
and OPNAVINST 5090.1B**

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Table of Contents

<u>TOPIC</u>	<u>PAGE</u>
I. PURPOSE AND NEED FOR THE PROPOSED ACTION	5
1.1 Purpose.....	5
1.2 Project Need.....	5
2. DESCRIPTION OF THE PROPOSED ACTION.....	6
2.1 Project Location.....	6
2.2 Project Design.....	6
2.3 Permits and Requirements	9
3. ALTERNATIVES CONSIDERED.....	11
3.1 Evaluation Factors	11
3.2 Construction Alternatives	11
3.2.1 No Action Alternative.....	11
3.2.2 Maintain Current Erosion Control System	13
3.2.3 Construct Gapped Breakwater System	13
3.2.4 Construct Core-Loc Seawall.....	14
3.2.5 Construct dune system.....	16
3.2.6 Construct Dune System with Beach Nourishment.....	16
3.3 Sand Sources For Dune and Beach Restoration	17
4. AFFECTED ENVIRONMENT.....	18
4.1 Soils	18
4.2 Hydrology and Wetlands.....	19
4.3 Ocean Borrow and Beach Replenishment Areas	19
4.4 Vegetation.....	22
4.5 Wildlife	22
4.6 Threatened and Endangered Species	22
4.7 Air Quality.....	23
4.8 Cultural Resources.....	23

4.9 Socioeconomic Description.....	23
4.10 Floodplain Management and Development.....	25
5. ENVIRONMENTAL CONSEQUENCES	25
5.1 Soils	25
5.2 Hydrology and Wetlands.....	25
5.3 Ocean Borrow and Beach Replenishment Areas.....	25
5.4 Vegetation.....	26
5.5 Wildlife	26
5.6 Threatened and Endangered Species	26
5.7 Air Quality.....	27
5.8 Cultural Resources.....	28
5.9 Socioeconomic Factors.....	28
5.10 Floodplain Management and Development.....	29
6. COORDINATION	29
7. MITIGATION MEASURES	30
8. CUMULATIVE ENVIRONMENTAL IMPACTS.....	30
9. CONCLUSION	31
10. REFERENCES.....	32
11. LIST OF PREPARERS AND PEOPLE CONSULTED	34
12. INDEX	36

List of Figures

Figure 1. FCTC Atlantic Vicinity and Site Map.....	7
Figure 2. Annotated Aerial Photo of Proposed Project Area.....	8
Figure 3. Preferred Alternative Construction Plan with Cross Section.....	10
Figure 4. Locations of Ocean Sand Borrow Area Units I, II, and III	20
Figure 5. Bathymetry of the Dam Neck Ocean Area	21

List of Tables

Table 1. Air Conformity Calculations (Preferred Alternative)	27
Table A1 Common Project Area Vegetation.....	38
Table A2 Common Beach and Nearshore Wildlife	38
Table A3 Common Beach and Nearshore Wildlife	40

Appendices

APPENDIX A Common Project Area Flora and Fauna.....	37
APPENDIX B Correspondence.....	41

ENVIRONMENTAL ASSESSMENT

Seawall (Restoration of Damaged Facilities)

Fleet Combat Training Center, Atlantic

I. PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Purpose

The purpose of the proposed project is to provide sufficient protection from storm and wave damage and beach erosion for Department of Defense facilities located near the Atlantic Ocean at the Fleet Combat Training Center, Atlantic, Virginia Beach, Virginia.

1.2 Project Need

Project need is based on studies and reports of consultants that have indicated that facilities located at Dam Neck are threatened by persistent beach erosion, storm surge, and high wave conditions.

Facilities located along the open coast are vulnerable to storm induced flooding and two types of shoreline erosion: long-term or gradual shoreline erosion; and short-term, storm-induced erosion. Flooding occurs when storm tides and waves overtop coastal dunes and engulf buildings located in low-lying areas. Long-term shoreline erosion, which is measured in terms of decades, is generally associated with the wave-driven movement of sediment alongshore and the offshore movement of sediment resulting from long-term rises in sea level. Long shore sediment transport dominates long-term shoreline movement in most cases. Intense ocean storms, such as hurricanes or northeasters, can cause a massive amount of beach and dune erosion during a relatively short time (i.e., 12 hours or less). Such erosion, which can cause the dune line to retract as much as 22 meters (75 feet) or more, occurs as the beach responds to the elevated water levels and accompanying wave heights of the storm system. The sand is eroded from the dune face and is deposited offshore.

The major buildings which are vulnerable to storm-induced damage are the BOQ area, the Shifting Sands Club area and the Weapons Gunline.

The BOQ area is composed of Building 225, a two story concrete building housing 53 Suites for senior officers and the commissioned Officers' Club, and Building 241, a four story steel frame and masonry building housing 95 sleeping rooms, W-1/0-2, and four flag officer suites. The cost to replace these facilities is estimated at approximately \$10 million. The Shifting Sands Club is a four year old, two story,

consolidated club attached to a one story masonry structure built in 1963. The complex includes bath houses and various support buildings, including picnic shelters. The cost to replace these facilities is estimated at approximately \$5 million.

The Weapons Gunline provides the only live, open-ocean, gunline in the Navy. It is composed of concrete structures to support gun turrets and gun mounts for all weaponry currently in use by the Navy. Concrete block houses contain associated support equipment, radar and work spaces. The entire gunline fronts Building 127, the largest building on FCTCLANT, which houses training spaces and command administrative spaces. The cost to replace Building 127 is estimated at approximately \$80 million. The total cost to replace these facilities is estimated to be \$95 million.

2. DESCRIPTION OF THE PROPOSED ACTION.

The following is a description of the Navy's preferred plan for reconstruction of the sand dunes and periodic beach nourishment to protect facilities at FCTCLANT, Dam Neck.

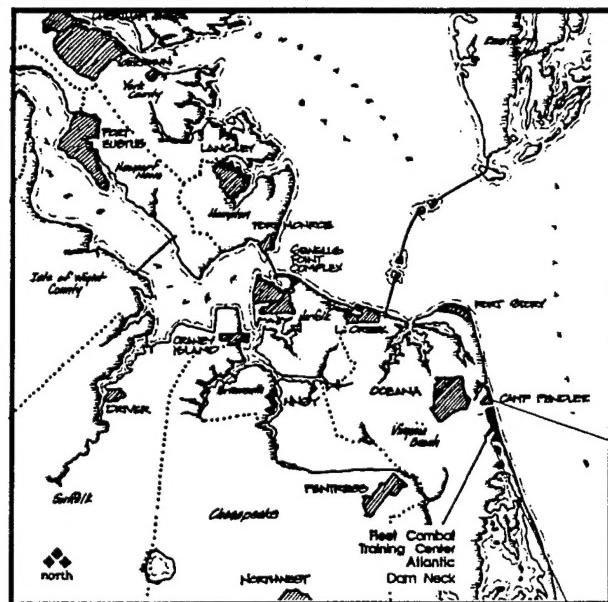
2.1 Project Location

FCTCLANT is located at Dam Neck, Virginia Beach, Virginia about nine miles south of Cape Henry along a 3.2 mile stretch of Atlantic Ocean shoreline (Figure 1). This ocean shoreline segment is bordered on the north by an Annex of Naval Amphibious Base, Little Creek known as Camp Pendleton and on the south by Sandbridge Beach, a residential community.

The project area is shown in Figure 2. The project site is located in the central part of the base along the Atlantic Ocean shore.

2.2 Project Design

The government preferred plan specifies the construction of a 1610 meter (5280 feet) long reinforced sand dune from approximately 180 meters (590 feet) north of the Bachelor Officer's Quarters (BOQ) to approximately 300 meters (984 feet) south of the Training Complex. The reinforced dune will consist of two sections with a natural stone core 11.3 meters (37 feet) wide by 2.7 meters (9 feet) high from the base of the lower level to the top of the higher level. The two sections would consist of one 290 meter (950 feet) long section seaward of the BOQ and a 670 meter (2200 feet) long section seaward of the Enlisted Men's Club and the Training Complex. The stone work will then be covered by a 30 meter (98 feet) wide by 3.7 meter (12 feet) high sand dune. The top of the dune would be at 6.7 meters (22 feet) above mean sea level. The dune will be continuous from south of the Training Complex to north of the BOQ. Sand for the proposed dune will be truck hauled to the site. Approximately 88,000 cubic meters (115,000 cubic yards) of sand would be required for the sand dune reconstruction. The dune is expected to cover

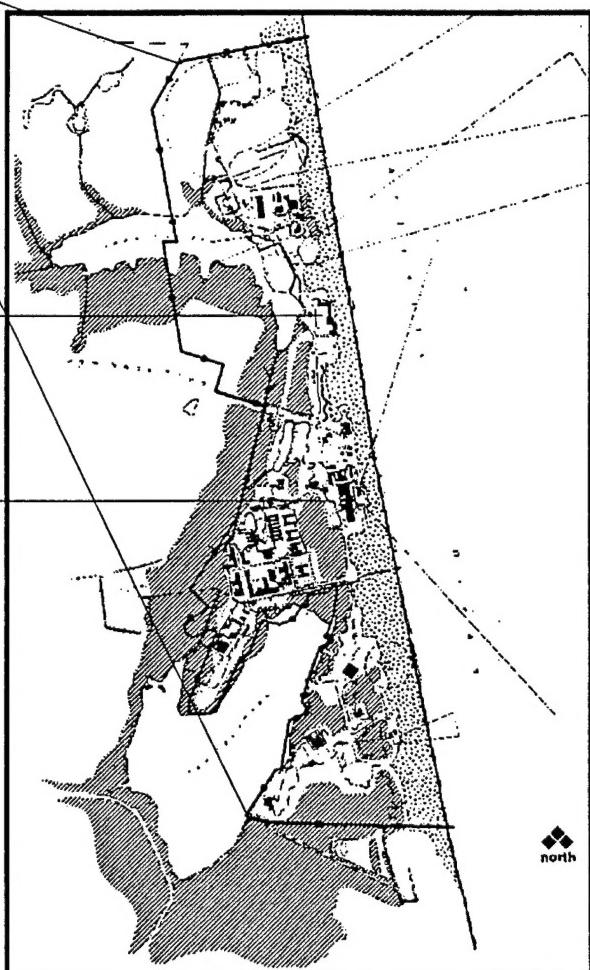


Vicinity Map

BOQ

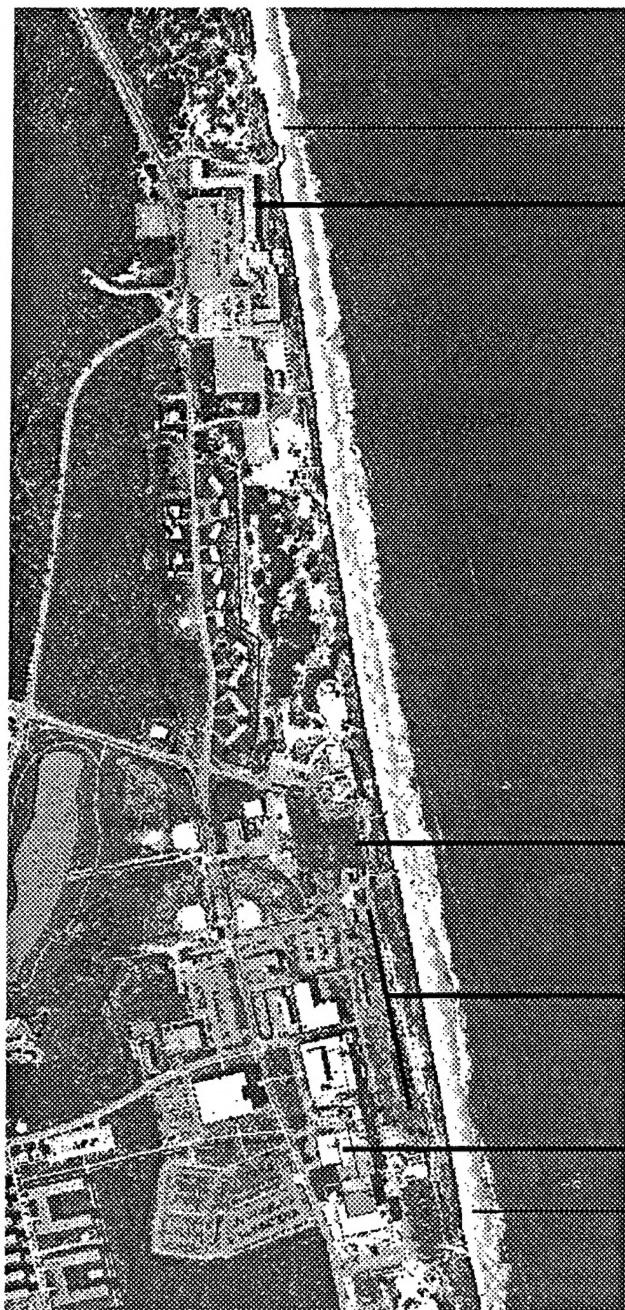
Weapons Facility

FCTC Atlantic Map



Not to scale

Figure 1. Dam Neck vicinity and FCTC Atlantic location map.



1 inch = 415 feet
1 centimeter = 50 meters

Figure 2. Annotated aerial photo of proposed project area. (US Navy Photo taken 13 April 1993).

approximately 4.5 hectares (11.2 acres) of near shore upland area. The dune would then be planted with American beach grass, Atlantic coastal panic grass, Sea oats, and Bitter panicgrass on 0.61 meter (2 foot) centers. Six bridges over the dune would be included in the project.

The beach restoration portion of the project calls for the placement of approximately 520,000 cubic meters (680,000 cubic yards) of sand along the Dam Neck beach in front of the reinforced sand dune. The beach nourishment part of the proposed project would be 2,800 meters long (9,280 feet). The fill would cover approximately 1.8 hectares of near shore upland area, 3.2 hectares of intertidal area, and 11.3 hectares of nearshore area below the mean low water line. Figure 3 shows the general layout of this plan. The sand would be dredged from an ocean borrow site approximately 5 kilometers (3 miles) offshore of the project site and then pumped from the dredge to the beach nourishment area. The beach would be maintained on a 12 year cycle with approximately 485,500 cubic meters (635,000 cubic yards) of beach quality sand.

2.3 Permits and Requirements

Joint Permit Applications For Activities in Waters and Wetlands of the Commonwealth of Virginia have been submitted. The permits address sections 404 and 401 of the Clean Water Act, Section 10 of the River and Harbors Act, and applicable state laws concerning construction and filling in waters of the United States as well as City of Virginia Beach requirements. The first permit (VMRC #95-0481) described a project which would use only upland sources of sand. The later application (to be submitted June 95) described an open ocean source for the beach nourishment part of the project. Normally, fill placed in the territorial sea would be regulated under the Marine Protection, Research, and Sanctuaries Act, however, dredged material placed as fill is regulated under the Clean Water Act. Commonwealth of Virginia review of coastal consistency as required by the Coastal Zone Management Act will be done during the processing of the Clean Water Act permit.

A Memorandum of Agreement (MOA) between the US Navy and the Department of Interior, Minerals Management Service, Office of International Activities and Marine Minerals will be necessary to allow the removal of sand from the offshore borrow area.

Dredging and beach fill activities conducted as part of this project would require consultation under section 7 of the Endangered Species Act.

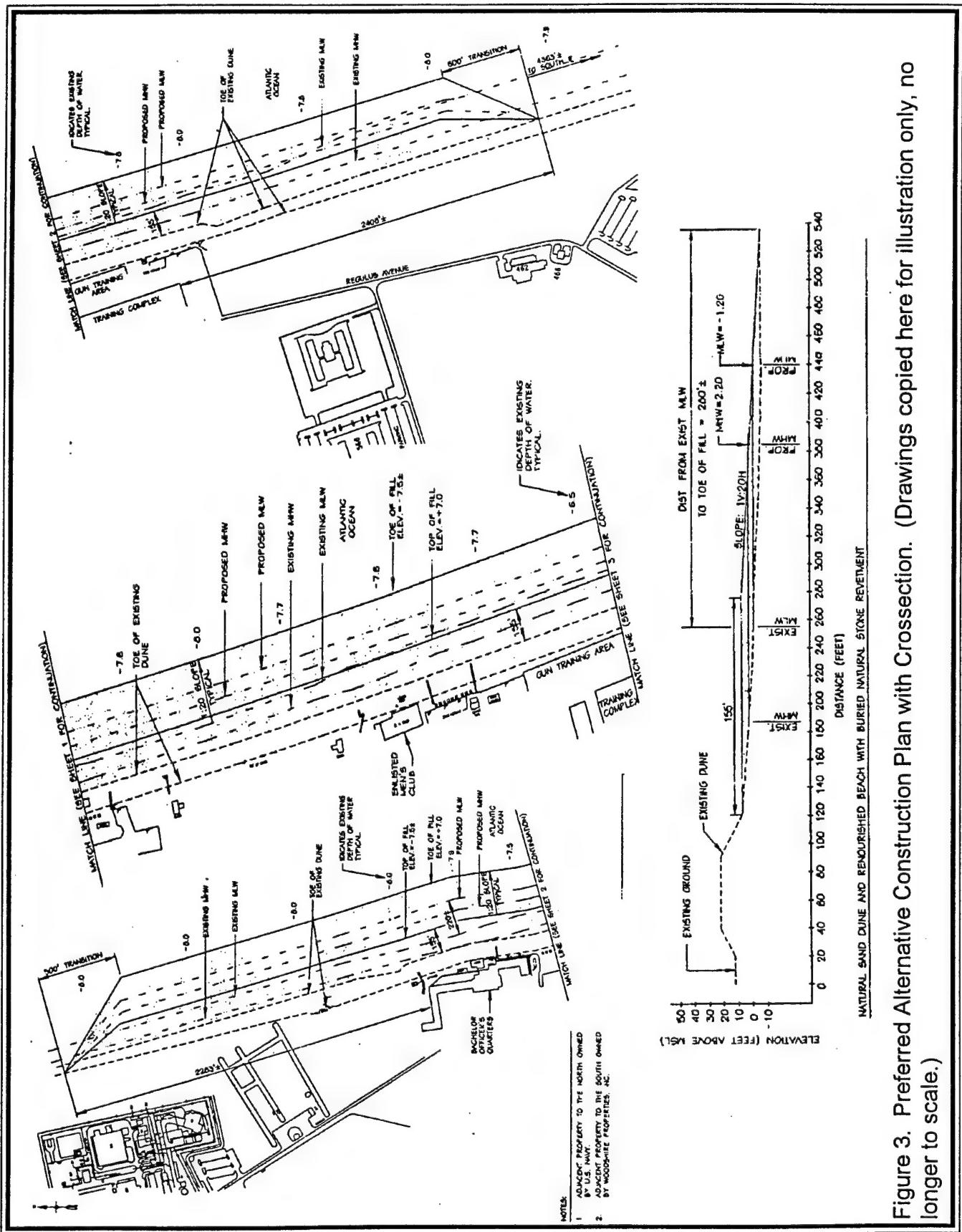


Figure 3. Preferred Alternative Construction Plan with Crossection. (Drawings copied here for illustration only, no longer to scale.)

3. ALTERNATIVES CONSIDERED

The following is the listing of the evaluation factors used to address applicability of the alternatives to the purpose and need for the project. This section also briefly describes the major alternatives which were evaluated using these factors.

3.1 Evaluation Factors

1. Provide the threatened facilities at FCTCLANT Dam Neck with sufficient protection from high water, wave, and erosion damage.
2. Minimizing environmental impact from both construction and long-term operation actions.
3. Reasonableness of the life cycle cost of maintenance and facility operations.
4. Maintenance of the recreational value of the beach.

3.2 Construction Alternatives

Alternatives considered during the planning and design of the project are as follows:

- No-Action
- Maintain current erosion control system
- Construct gapped breakwater system
- Construct Core-Loc seawall
- Construct dune system
- Construct dune system with beach nourishment

Various sand sources for dune and beach restoration were also considered, including:

- Truck haul from nearby borrow pits
- Dredge material from offshore borrow areas

3.2.1 No Action Alternative

FCTCLANT could choose to take no corrective action and allow nature to take its course, relying on the fact that beach sand generally erodes during the fall and winter, and is returned during spring and summer for an average net loss of 3.5 feet of shoreline per year. This does not take into consideration any severe storms affecting the three portions of shoreline considered the most fragile.

In an erosion study, prepared for FCTCLANT, Dam Neck, and Atlantic Division, Naval Facilities Engineering Command, by the Center of Expertise for Harbor and Coastal Engineering in September, 1991, dune erosion models were projected

based on the effects of the two most significant coastal storms during this century, these being the August 1933 hurricane and the March 1962 "Ash Wednesday" northeaster.

The BOQ area was significantly impacted by both storm events. The pre-storm dune (September 1991) would be completely removed under both storm events and leveled to an elevation of between 13 to 14 feet. It is likely that Building 225 would be periodically subjected to wave uprush during either of the storms. This is preferable to a situation where the storm tide inundates the building, however it is not a desirable condition. Building 241 would be subjected to wave uprush and attendant flooding during both storms.

The dune area between the Shifting Sands Club and the ocean is relatively high and wide. As a result, neither of the storm events would breach this dune. It is concluded that the Shifting Sands Club is less vulnerable to storm induced damage than the BOQ area for present shoreline conditions. However, the future integrity of this frontal dune is at issue. Over the last two years, occurrence of northeasters has caused erosion at a much more accelerated rate than was anticipated by the erosion study in 1991. It is doubtful that the frontal dune has the integrity to withstand a major storm.

The predictions for the Weapons Gunline indicate that the narrow frontal dune will be completely removed and leveled to an elevation of 12 feet. The area landward of the eroded dune is at the same elevation. As a result, heavy overtopping and attendant inland flooding of interior areas would result. Fortunately, the larger buildings in the area, e.g., Building 102 and 127, would be about 200 - 250 feet from the eroded water line position. Nevertheless some penetration of wave energy and flooding is possible since the ground area landward of the dune is low compared to the predicted wave run up elevation. Smaller structures and utilities in the area between the eroded shoreline position and Regulus Avenue would, in all probability, be subjected to wave overtopping.

In summary, the remaining coastal dunes fronting the BOQ, Shifting Sands Club and Weapons Gunline areas are not of sufficient height and/or width to withstand a single major storm event. This alternative was rejected from further consideration because it did not meet the evaluation criteria. Specific problems caused by this alternative would be the loss of structures critical to the continued operation of the facility and significant adverse environmental impact from continued erosion. Recreational beach users would be forced to use other nearby recreational beaches. Economic impact of this plan is estimated to be up to \$95 million in structure replacement costs. Other related costs such as alternate training site use and transportation can not be calculated at this time.

3.2.2 Maintain Current Erosion Control System

This alternative is described separately from the "No Action" alternative because even though it is the current condition at Dam Neck, it requires continuing actions which are technically not a "No Action" plan.

Revetments have been constructed with semi-rigid structural units, 5 foot by 10 foot sandbags weighing approximately 2 tons when filled. Sandbags of this type and size form a base for reconstructing the dune line.

The empty, porous fabric bags are hand carried to the beach, a portable sand pump is used to fill each bag with a slurry of sand (borrow) and seawater. The water passes out through the permeable bag fabric. The dune line is then reconstructed on top of this base of sand bags. This type of shore stabilization has been used exclusively on the Outer Banks of North Carolina since the 1960's.

The filled bags provide a "semi-permanent" base for the dune system that can be exposed to northeasters or hurricanes several times before being damaged beyond repair. This alternative requires a small initial investment for the Navy. However, due to the high maintenance required, this solution has been considered temporary.

This solution has been implemented in front of the two most critical areas, the BOQ complex and the Shifting Sands Club. A continuous maintenance expenditure of approximately \$200,000 per year is required.

The plan would allow the continued operation of threatened facilities, although the margin of safety during an unusually intense storm season would be lower than for other alternatives. Damage to structures is avoided however, annual maintenance activities are required, thus beach area disturbance is frequent. This alternative was dropped from further consideration since the projected maintenance costs for this alternative are uncertain and provide a lower level of protection to FCTCLANT Dam Neck shore facilities.

3.2.3 Construct Gapped Breakwater System

Near-shore gapped stone breakwaters have become more common in Virginia and Maryland, particularly in the Chesapeake Bay, Choptank River and Potomac River. These structures consist of stone breakwaters, varying from 15 to 45 meters (50 feet to 150 feet) in length with a top elevation of 0.6 to 1.5 meters (2.0 to 5 feet) above mean high water. The gaps between the breakwaters vary from 30.5 to 61 meters (100 feet to 200 feet). Attachment of the shoreline and breakwaters are achieved by

emplacement of suitable fill sand. The beach would also be nourished with suitable off-site borrow sand.

The breakwaters are designed to dissipate wave action and retain the beach. The beach functions both to protect the newly replenished dune system from wave attack and to provide a recreational area.

The Shoreline Erosion Advisory Service recommended investigation of this method of erosion control as a possible solution to the problem at Dam Neck. The gapped breakwater design is based on empirical performance data from existing breakwaters. Because of this, the effectiveness of a gapped breakwater system as with any shoreline protection system cannot be fully predicted before construction. This system has, to date, been limited to tidal waters in the Chesapeake Bay and its' tributaries and has not been used to protect an ocean beach. The U. S. Army Corps of Engineers has stated that gapped stone breakwaters, of the size required for the Atlantic Ocean Coast, would be an extremely costly venture and have not been used along ocean coasts.

This plan was eliminated from further consideration due to the level of engineering uncertainty that this possible solution was not appropriate for the ocean environment and the potentially excessive costs of the undertaking.

3.2.4 Construct Core-Loc Seawall

The construction of a seawall system that would sustain major storm attack associated with hurricanes, northeasters and 100-year storms entirely of natural quarried stone or precast armored units would provide the needed protection with no dune reconstruction and no beach replenishment and with low maintenance cost.

A natural stone revetment was designed to provide for protection from the 100-year storm. The geometric design of the stone revetment was accomplished using the standard practices set forth in the U. S. Army Corps of Engineers Shore Protection Manual, 1984. The back (landward side) of the structure is at elevations 2.4 meters (8.0 feet), rising at a slope of 2H:1V to a height of 6.7 meters (22.0 feet) and dropping at the same slope, with the toe at an elevation of -1.8 meters (-6.0 feet).

The stone revetment would be constructed of quarried stone with a median weight of 3.9 metric tons (4.3 tons). The width of the structure, perpendicular to the shoreline would be 33.5 meters (110 feet).

Because the armor stone layers were designed using the maximum water level, wave height, and eroded beach elevation conditions, it should not experience damage from wave energy over the life of the structure unless a storm exceeding the design conditions were to develop. No maintenance is expected for the selected toe design of -1.8 meters (-6 feet).

Stones of the size needed are expensive and difficult to ship causing high transportation and placement costs. In order to reduce the material and placement costs, and to minimize availability constraints, a design utilizing precast concrete armor units designed by the U. S. Army Corps of Engineers called Core-Loc was considered.

The U. S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi developed a computer program called PC-Armor which utilized the design conditions and stability coefficient to establish the required weight for the precast armor unit. The output of the computer run indicates a required weight of 2 metric tons (2.23 tons), almost half the weight of the quarried stone.

Because the Core-Loc unit interlocks with its neighbors a steeper slope of 1.5H:1V can be used in the geometric design of the structure. The resulting geometry, while maintaining the toe elevation at -1.8 meters, would reduce the width of the revetment by approximately 6.1 meters (20 feet) while maintaining the same degree of protection.

The Core-Loc design represents a high initial cost while providing a solution that is anticipated to have low or no maintenance costs through the life of the structure. Protection would only be afforded to the BOQ and the Shifting Sands Club to Weapons Facility areas. A connecting dune or beach nourishment is not part of this project.

This plan (Core-Loc placement) would not require excavation or construction within tidal waters and would therefore not require a Federal permit under the Clean Water Act.

This plan was not recommended for further consideration, since it would lead to the eventual complete loss of beach in front of the Core-Loc structure. It would also protect a smaller amount of shoreline than the preferred plan.

3.2.5 Construct dune system

The dune system plan would require the construction of a 1610 meter (5280 feet) long reinforced sand dune from approximately 180 meters (590 feet) north of the Bachelor Officer's Quarters (BOQ) to approximately 300 meters (984 feet) south of the Training Complex. The reinforced dune will consist of two sections with a natural stone core 11.3 meters (37 feet) wide by 2.7 meters (9 feet) high from the base of the lower level to the top of the higher level. The two sections would consist of one 290 meter (950 feet) long section seaward of the BOQ and a 670 meter (2200 feet) long section just seaward of the Enlisted Men's Club and the Training Complex. The stone work will then be covered by a 30 meter (98 feet) wide by 3.7 meter (12 feet) high sand dune. The top of the dune would be at 6.7 meters (22 feet) above mean sea level. The dune will be continuous from south of the Training Complex to north of the BOQ. Sand for the proposed dune will be truck hauled to the site.

Approximately 88,000 cubic meters (115,000 cubic yards) of sand would be required for the sand dune reconstruction. The dune is expected to cover approximately 4.5 hectares (11.2 acres) of near shore upland area. Six bridges over the dune would be included. All materials would be delivered by truck. No beach replenishment or reconstruction would be involved.

This plan was dropped from further consideration in favor of a dune system with beach nourishment plan because it would allow the continued loss of beach seaward of the dune area. Maintenance of the system would be more frequent without beach nourishment because wave action close to the base of the dune would remove sand from the dune almost continuously. The recreational value of the beach seaward of the project would be lost since the beach would consist of a narrow strip of sand resulting from dune erosion.

3.2.6 Construct Dune System with Beach Nourishment

This plan specifies the construction of a 1610 meter (5280 feet) long reinforced sand dune from approximately 180 meters (590 feet) north of the Bachelor Officer's Quarters (BOQ) to approximately 300 meters (984 feet) south of the Training Complex. The reinforced dune will consist of two sections with a natural stone core 11.3 meters (37 feet) wide by 2.7 meters (9 feet) high from the base of the lower level to the top of the higher level. The two sections would consist of one 290 meter (950 feet) long section seaward of the BOQ and a 670 meter (2200 feet) long section just seaward of the Enlisted Men's Club and the Training Complex. The stone work will then be covered by a 30 meter (98 feet) wide by 3.7 meter (12 feet) high sand dune. The top of the dune would be at 6.7 meters (22 feet) above mean sea level. The dune will be continuous from south of the Training Complex to north of the BOQ. Sand for the proposed dune will be truck hauled to the site. Approximately 88,000 cubic meters (115,000 cubic yards) of sand would be required for the sand dune reconstruction. The dune is expected to cover approximately 4.5 hectares (11.2

acres) of near shore upland area. Six bridges over the dune would be included in the project.

The beach restoration portion of the project calls for the placement of approximately 520,000 cubic meters (680,000 cubic yards) of sand along the Dam Neck beach in front of the reinforced sand dune and approximately 610 meters to the north and south of the dune ends. The total length of the beach replenishment area would be 2800 meters (9280 feet). The restoration fill would cover approximately 1.8 hectares (4.45 acres) of near shore upland area, 3.2 hectares (7.9 acres) of intertidal area, and 11.3 hectares (27.9 acres) of nearshore area below the mean low water line. Figure 3 shows the general layout of this plan. The sand would be dredged from an ocean borrow site approximately 5 kilometers offshore of the project site and then pumped from the dredge to the beach nourishment area. Maintenance of the beach would be done on a 12 year cycle and require 486,000 cubic meters (635,000 cubic yards) of sand per cycle. Approximate cost would be \$6-7 million in 1995 dollars.

Sand for the dune reconstruction would come from commercial borrow pits located within 10 miles of the project site. The approximate volume of sand needed for dune construction would be 88,000 cubic meters (115,000 cubic yards). The dune would be planted with American beach grass, Atlantic coastal panic grass, Sea oats, and Bitter panicgrass on 0.61 meter (2 foot) centers (Department of the Navy, 1995b). The dune system would require approximately 11,850 cubic meters (15,500 cubic yards) of sand per year for maintenance. This sand would also be obtained from local borrow pits.

The placement of sand on the beach would be a fill of navigable waters and would require Federal and State permits.

This plan is the preferred alternative. All criteria are met in that the plan allows efficient operation of the facility, the plan minimizes impact on the environment due to the 12 year maintenance cycle, the plan can be accomplished at a reasonable cost given the constraints imposed by beach erosion problems. This plan would also retain the recreational value of the beach.

3.3 Sand Sources For Dune and Beach Restoration

In addition to the use of nearshore sand and on-shore borrow pit sources for dune restoration described above, sand from additional nearby borrow pits as well as ocean borrow areas one to three miles offshore of Dam Neck were considered. Choice of sand sources was based primarily on the cost for the sand. In some cases when the amount of sand needed is relatively small, truck haul is the preferred method. For large amounts of sand, dredging is generally less expensive.

Several potential sources of sand for the dune restoration are located near Dam Neck. Truck haul would be used to move the sand from the borrow pit to the project site. The duration of the sand supply operation would be approximately 80 days with 100 to 150 trips per day. The haul route would be from the Pungo area borrow pits, along General Booth Boulevard, to the Main Gate of Dam Neck and the project site.

Three alternative offshore locations have been identified as potential sources of sand for beach nourishment. These sites are located with their centers at approximately 1.6, 3.2, and 4.8 kilometers (1, 2, and 3 miles) due east of Sandbridge. These sites are designated units III, II, and I in figure 4. None of these sites or the material in them have been associated with any form of offshore dumping, such as dredged material placement or solid waste disposal. They are virgin sources of beach fill material and their use would not cause adverse effects associated with hazardous or toxic materials. Median grain size determinations at each of these locations indicate the quality of this material is generally suitable as beach fill material. At the Unit 1 site, the sand is located on the surface of the sea floor. The grain size composition of this material is compatible with the beach's median energy levels to the extent that no overfilling would be required at the beach to compensate for loss of the fine-grained material component. This site also has the best sand for beach replenishment and has the greatest capacity. The estimated volume of sand in unit I is 80 million cubic meters (104 million cubic yards).

Evaluation of the sand sources was done based primarily on the time it would take to get the project under construction and then cost. On shore sources can be used more quickly than offshore sources primarily due to permit requirements. Federal and State agencies have previously recommended that the best alternative for offshore borrow for beach nourishment is Unit I (Norfolk District, US Army Corps Of Engineers, 1992). Unit I would be the preferred source for beach nourishment sand.

4. AFFECTED ENVIRONMENT

The following description of the various aspects of the affected environment have been limited to the local environment which would potentially be affected by the proposed project. The potential impacts to each of the following environmental aspects are discussed in the correspondingly numbered paragraphs in section 5.

4.1 Soils

The soil content is sand, as is consistent with a dune environment, and is non-hydric. Furthermore, the seawall site is in the center of the base in an area designated by a 1989 study prepared by the U. S. Fish and Wildlife Service as an Urban Habitat. "The urban cover type includes buildings, parking areas, roads, ball fields, and lawns maintained by frequent mowing. Thirty-five percent of 337 acres of the installation is classified as urban. The central portion of the base is the most urbanized..." (Ruddy,

George M., 1989). The proposed on-shore part of the project area is not prime and unique farmland due to the extreme porosity of the soil and its location immediately adjacent to the Atlantic Ocean.

4.2 Hydrology and Wetlands

There are no defined hydrologic features such as streams in the proposed project area due to the high porosity of the sand. Rainfall generally rapidly soaks into the sand with little surface runoff.

There are no wetlands in the project area due to the lack of adequate hydrology. The rapid depletion of surface water does not allow the establishment of wetland communities even at the base of the sand dunes.

4.3 Ocean Borrow and Beach Replenishment Areas

The proposed ocean borrow area is located almost directly off Sandbridge Beach at an area referred to as the Sandbridge Shoal (Kimball, Suzette M., Dame, James K. II, Hobbs, Carl H. III, 1991). This site is Unit I in the previously referenced publication. Two additional areas referred to as Units II and III were also evaluated as possible sand sources. Figure 4 is a map of the ocean area to the east of Dam Neck and Sandbridge Beach showing the locations and relative height of the sand areas above the ocean floor.

The benthos of the mid-Atlantic shelf are generally more diverse and abundant in deeper waters of the shelf and in depressions of ridge and swale features. The inner shelf undergoes wide yearly fluctuations in water temperature and is affected by wave action, and thus provides a more rigorous and stressful environment in which fewer species have adapted than the central or outer continental shelf.

In general, the benthic fauna expected at this site would be similar to that found at the Norfolk Disposal Site located approximately 32 kilometers (20 miles) to the north (Alden et al., 1981).

The bathymetry of the offshore area at Dam Neck is characterized by slightly less water depth than offshore areas immediately to the south (Defense Mapping Agency Nautical Product 12BCO12208, dated 15 April 1978). An inset from this chart is contained in figure 5.

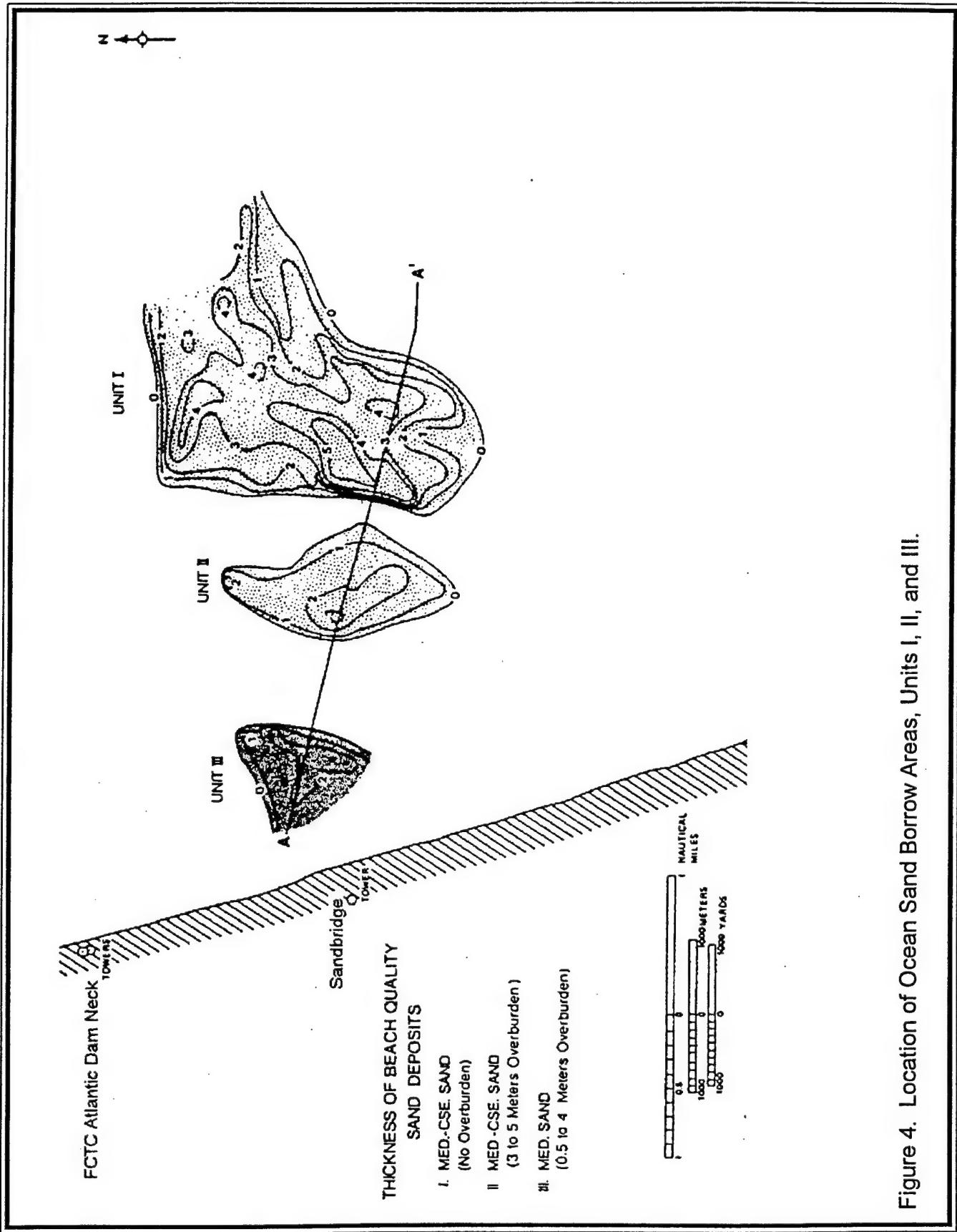


Figure 4. Location of Ocean Sand Borrow Areas, Units I, II, and III.

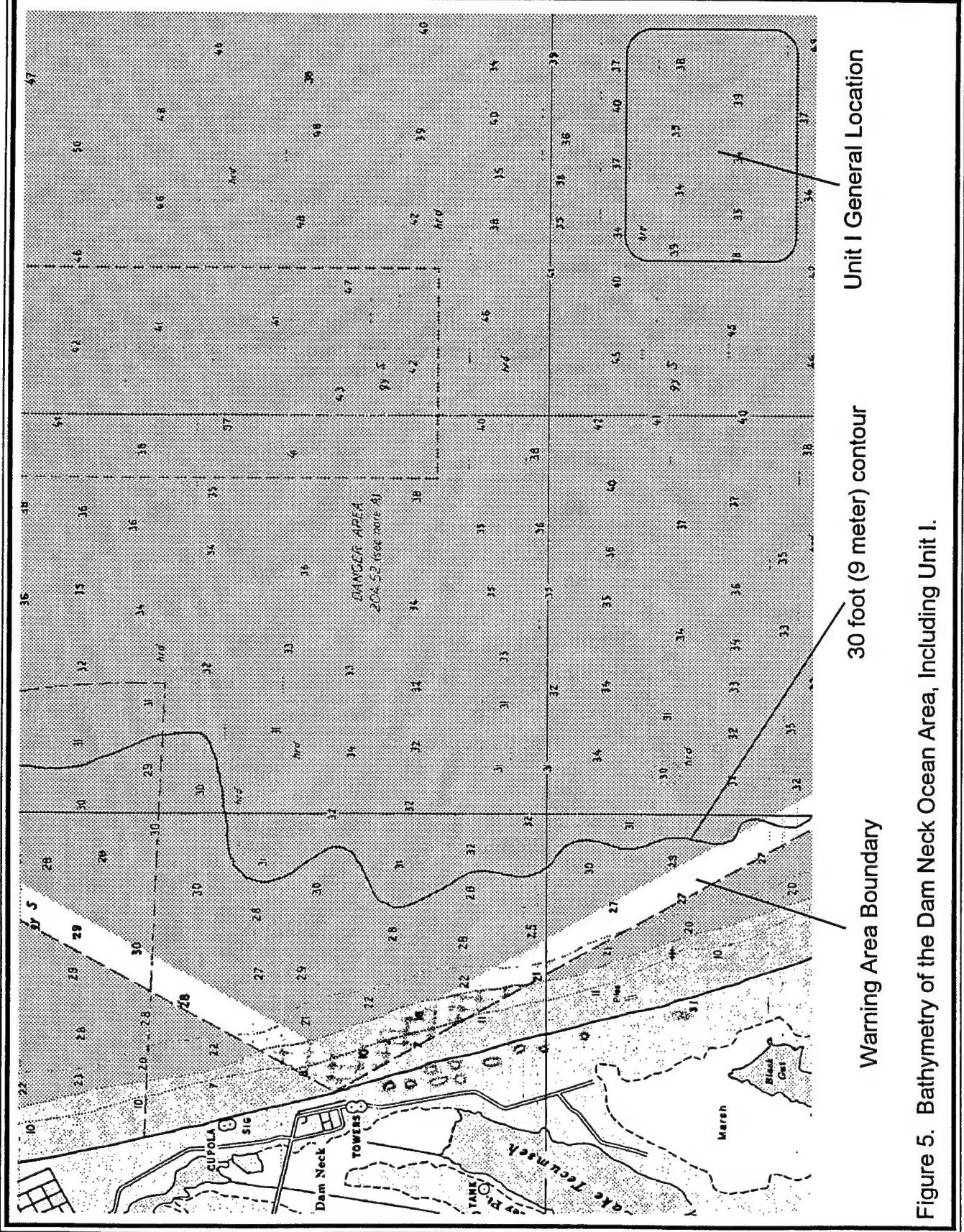


Figure 5. Bathymetry of the Dam Neck Ocean Area, Including Unit I.

4.4 Vegetation

The beach is normally characterized by either no dune or a small irregular dune lying seaward of the oceanfront. The dune is vegetated primarily with sparse stands of beachgrass, *Ammophila breviligulata*, and sea oats, *Uniola paniculata*. Common vegetation associated with the general area is listed in Appendix A.

No aquatic vegetation would be expected at the offshore borrow area due to the high wave energy normally expected at the site.

4.5 Wildlife

Appendix A lists some of the wildlife expected to be found in the project area. No rare or endangered species inhabit the area, although a loggerhead turtle nest was found at Dam Neck on 8 July, 1992. The eggs were successfully moved to another more protected location.

4.6 Threatened and Endangered Species

According to records maintained by the U. S. Fish and Wildlife Service Office of Endangered Species in Annapolis, Maryland, with the exception of occasional transient individuals, no Federally-listed or proposed endangered or threatened species are known to exist on the installation. Some species, however, deserve mentioning because of their potential for occurrence. FCTCLANT is within the northern limit for nesting by the endangered loggerhead sea turtle (*Caretta Caretta*). In order for the ocean beaches to be suitable for nesting sea turtles, the beaches must be allowed to maintain their natural processes. Use of the beaches for recreation, vehicular use of the beaches for security purposes, as well as firing of shipboard weaponry over the beaches make the beaches in the central portion of FCTCLANT unsuitable habitat for loggerhead nesting. The loggerhead turtle nest was found near the Shifting Sands Club.

The pungo mouse (*Peromyscus Leucopus Easti*) has been trapped on FCTCLANT Dam Neck. This is a candidate species for listing (C2) under the Endangered Species Act (Virginia Department of Conservation and Recreation, 1992).

No additional rare or endangered plants or animals are known or expected to be found in the project area.

Effective October 1, 1987, the Virginia Department of Game and Inland Fisheries established a State Endangered Species List in addition to the Federally-listed species. Species on the State List are legally protected and may not be taken, transported, possessed, sold or offered for sale within the Commonwealth of

Virginia. None of the species on the State List are known to exist in the proposed project area.

Nine rare plant species were recorded near FCTCLANT Dam Neck prior to 1989. Six of these species were recorded from a series of interdunal swells which were described by M. L. Fernald in Local Plants of the Inner Coastal Plain of Southeastern Virginia, 1937. Three of these rare plants were found during the 1989 survey, but only in the northern and southern portions of the installation, but not in the proposed project area (Virginia Department of Conservation and Recreation, 1992).

Based on sightings and expected migration patterns, the threatened loggerhead sea turtle (Caretta caretta) and the endangered Kemp's ridley (Lepidochelys kempi), green (Chelonia mydas) and leatherback (Dermochelys coriacea) sea turtles, as well as fin (Balaenoptera physalus), humpback (Megaptera novaengliae), and right (Eubalaena glacialis) whales may occur in the vicinity of the offshore sand borrow area and along the transport path for the dredged sand.

4.7 Air Quality

Air quality in the Hampton Roads area is in compliance with current Environmental Protection Agency (EPA) criteria for sulfur dioxide, nitrogen oxides, carbon monoxide, airborne lead, and inhalable particulate matter. However, Hampton Roads is a marginal non-attainment area for ozone. Marginal non-attainment is classified as having ozone levels of 0.121 parts per million but not including 0.138 parts per million (Virginia Department of Environmental Quality 1993). This means that the total emissions, including both direct and indirect, for any proposed activity must be less than 100 tons per years for ozone depleting substances to be considered as not having an adverse effect on air quality.

4.8 Cultural Resources

Two sites of national historic interest, the Cape Henry Lighthouse and the Cape Henry National Memorial, are located north of 89th Street within the Fort Story Military Reservation. The Cape Henry Lighthouse is on the National Register of Historic Places and is privately administered. The Cape Henry National Memorial, also known as the First Landing Cross, is administered by the Colonial National Historical Park, National Park Service. The Cape Henry Lighthouse is also cited in the Virginia Historic Landmarks Register. Other historical sites and other points of interest near the oceanfront are available to the public. These include the Virginia Beach Arts Center, Virginia Beach Maritime Historical Museum, the Norwegian Lady, and the Virginia Beach Marine Science Museum.

4.9 Socioeconomic Description

FCTCLANT is located at Dam Neck, Virginia Beach, Virginia about nine miles south of Cape Henry along a 5.2 kilometer (3.2 mile) stretch of Atlantic Ocean shoreline. This ocean shoreline segment is bordered on the north by the Naval Amphibious Base, Little Creek Annex known as Camp Pendleton and on the south by Sandbridge Beach, a residential community.

The mission of FCTCLANT provides training in the operation, maintenance, and employment of special tactical combat direction and control systems typical to naval warfare. As the host activity, FCTCLANT also provides facilities, maintenance, and personnel support to tenant commands. There are approximately 12 tenant commands located at FCTCLANT Dam Neck, including training schools, personnel support activities, and base support activities.

The major buildings which are vulnerable to storm-induced damage are the BOQ area, the Shifting Sands Club area and the Weapons Gunline. The BOQ area is comprised of Building 225, a two story concrete building housing 53 suites for senior officers and the commissioned Officers' Club, and Building 241, a four story steel frame and masonry building housing 95 sleeping rooms, W-1/0-2, and four flag officer suites. The cost to replace these facilities is estimated at approximately \$10 million. The Shifting Sands Club is a four year old, two story, consolidated club attached to a one story masonry structure built in 1963. The complex includes bath houses and various support buildings, including picnic shelters. The cost to replace these facilities is estimated at approximately \$5 million.

The Weapons Gunline provides the only live, open-ocean, gunline in the Navy. It is comprised of concrete structures to support gun turrets and gun mounts for all weaponry currently in use by the Navy. Concrete block buildings house associated support equipment, radar and work spaces. The entire gunline fronts Building 127, the largest building on FCTCLANT, which houses training spaces and command administrative spaces. The cost to replace Building 127 is estimated at approximately \$80 million.

The northern end of Virginia Beach's oceanfront shoreline begins at Fort Story property line, near 89th Street. It then extends southward, uninterrupted, for approximately 5 miles where Rudee Inlet connects Lakes Rudee and Wesley with the Atlantic Ocean. From Rudee Inlet to the North Carolina State line (a distance of about 16 miles) the beach front is occupied by the residential beach at Croatan, Camp Pendleton State Reservation, the Dam Neck Navy training facility, and the Back Bay National Wildlife Refuge. Sandbridge, centrally located on this 21-mile shoreline, lies between Dam Neck and the Back Bay National Wildlife Refuge.

4.10 Floodplain Management and Development

The entire project is located within the 100 year floodplain. The floodplain exists due to storm and wave surge flooding along the Atlantic Coast.

5. ENVIRONMENTAL CONSEQUENCES

The following section describes the types of impacts expected in each of the categories listed in section 4.

5.1 Soils

The proposed project is expected to have no effect on soils since the majority of the material used to construct the project will be sand of the same general grain size and type as the current beach/dune composition. The buried seawall is not expected to cause any effect on soil movement or composition.

5.2 Hydrology and Wetlands

No change in hydrology or vegetated wetlands is expected as part of this project. The beach nourishment part of the project will cover approximately 16.3 hectares (40 acres) of nearshore subaqueous bottom with sand. The long term effect of this fill would not be significant since the organisms present in this habitat will rapidly return to the filled area (Norfolk District, US Army Corps Of Engineers. 1992). Short-term effects due to the fill will be relatively minor, due to the rapid recovery of the local ecosystem from the disturbance.

5.3 Ocean Borrow and Beach Replenishment Areas

The Norfolk District, Corps of Engineers found that the use of the Unit I borrow area would not have a significant adverse environmental impact (Norfolk District, US Army Corps Of Engineers. 1992.). However, the National Marine Fisheries Services voiced concerns about the potential effects of the use of this borrow area on loggerhead and Kemps ridley sea turtles. The time period June through August would be used as the interval during which beach surveys would be conducted prior to fill or beach disturbing construction activities. Areas which indicate Loggerhead turtle nesting activity will be closed to all construction activities until the presence of a nest can be confirmed and the eggs moved to a safer location. The sand dredging operation may require dredging operations during June through August. Coordination with the National Marine Fisheries Service is underway to confirm that no potential impacts to sea turtles will occur. The dredging of the sand borrow area is not expected to effect Loggerhead or Kemps ridley turtles due to the remoteness of the site from beach and shallower bottom locations.

The total sand for beach nourishment used for the Dam Neck project over a 50 year project life would be approximately 2.5 million cubic meters (3.2 million cubic yards).

This is approximately 3 percent of the total available sand at the proposed ocean borrow site, Unit I.

5.4 Vegetation

While some dune vegetation may be affected during project construction, the long term dune vegetation will be enhanced by the planting of the reconstructed dune. The dune would be planted with American beach grass, Atlantic coastal panic grass, Sea oats, and Bitter panicgrass on 0.61 meter (2 foot) centers (Department of the Navy, 1995b). This planting is included in the contract specifications for this project.

5.5 Wildlife

No significant adverse long or short term effects to wildlife from the project are anticipated. Very little wildlife currently exists in the project site. After project construction, the area may support a small indigenous wildlife population.

5.6 Threatened and Endangered Species

Informal endangered species consultation with both the US Fish and Wildlife and National Marine Fisheries Services (FWS and NMFS) has been initiated by letter (see Appendix B).

The project would not effect any threatened or endangered (T&E) species on Dam Neck or at the ocean sand borrow area. The nesting of loggerhead turtles is the only land based T&E action which might be affected by the project. The chance of turtle nesting at the effected portion of the beach during project construction is small. The beach is regularly patrolled, and any evidence of loggerhead turtle activity will be investigated and properly mitigated if it is found. No effect on the Pungo mouse is expected due to the lack of suitable habitat in the proposed project area.

The NMFS has expressed concern (see letter dated JUN 16 1994 in Appendix B) with the potential effect on protected species due to the oceanic borrow and dredge movement portions of the project. The dredging of the sand borrow area should not effect sea turtles due to the remoteness of the site from beach and shallower bottom locations. In addition, the proposed borrow location is composed of medium to coarse sand which would generally not support the benthic resources sought by some of the turtles. The response to the NMFS letter dated 6 July 1995 is also contained in Appendix B. The NMFS has issued a Biological Opinion under Section 7 of the Endangered Species Act (NMFS, 1993). As a result of this opinion, the NMFS issued the Norfolk District, Army Corps of Engineers incidental take limits of one documented Kemp's ridley or green turtle, or eight loggerhead turtles. The smaller scope of the proposed Dam Neck project would indicate a lower potential for adverse impact on these turtles.

Dredging, dredge movement, and sand pumpout are not expected to adversely affect whale populations in the vicinity of the project

In order to reduce the potential for adverse effects on protected species, the following mitigation measures are being studied:

- The use of a hydraulic dredge rather than a hopper dredge to dredge the offshore borrow area would be specifically addressed by the Navy.
- If a hopper dredge is used, NMFS approved observers would be used once surface water temperatures reached 20°C or by May 15 (whichever comes first) through November 30 of the project year. Weekly summary reports would be submitted to the Northeast Region by the observers.
- The hopper dredge would be equipped with screening in order to monitor intake and overflow for turtles or turtle remains.
- A report summarizing the results of the dredging and sea turtle take would be submitted by the observers to the Navy and NMFS within 15 days of project completion.

5.7 Air Quality

No significant deterioration of air quality would be expected due to the construction or operation of this project. In addition, the proposed project would conform to the Commonwealth of Virginia Air Quality Implementation Plan.

The following table summarizes the calculation of total VOC and NOX air emissions due to project construction. The calculated levels of VOC and NOX is below de minimus level of 100 tons per year for both pollutant classes. This table is based on conservative estimates of emission sources due to the construction (including sand truck haul and offshore dredging) of the proposed project and may overestimate total emissions. In light of this, these calculations should not be used for regulatory purposes. This approach was done to insure all activities were included and to show the maximum expected levels of total emissions. Calculation of expected emissions and determination of conformity used procedures outlined in Department of the Navy, 1995c.

Table 1. Air Conformity Calculations (Preferred Alternative)

FCTCLANT Shoreline Protection and Restoration Project			Emission Factor			
Emission Source	Total Hours		lbs/hour	Total Emissions		
			VOC	NOX	VOC	NOX
Bulldozers	800.0		0.410	0.320	328.0	256.0
Front-end Loaders	400.0		0.250	1.890	100.0	756.0
Crane	1000.0		0.152	1.690	152.0	1690.0
Concrete/Dump Trucks	13600.0		0.192	4.166	2611.2	56657.6
Dredge	504.0		13.373	167.164	6740.1	84250.7
Commuter Vehicles	80.0		0.098	0.094	7.8	7.5
		TOTAL EMISSIONS (lbs/yr)			9939.1	143617.9
		TOTAL EMISSIONS (tons/yr)			5.0	71.8

5.8 Cultural Resources

The proposed project will have no impact on cultural resources. This finding is based on a letter from the Virginia State Historic Preservation Officer dated July 25, 1990 for a dune reconstruction project (see Appendix B). The beach nourishment portion of the project would have no effect on cultural resources. No sites for offshore historical or cultural resources are known to exist along the affected Dam Neck shore. A copy of a 1990 letter from the Virginia SHPO is contained in Appendix A. This project is in reference to a reinforced dune structure similar to the dune part of the preferred alternative. The SHPO agreed with the Navy conclusion that the undertaking would have no effect on cultural resources. In addition, the proposed project was discussed with the Virginia State Historic Preservation Officer (SHPO) in May, 1995. As a result of this discussion, the beach nourishment part of the project and dredging of the offshore sand borrow area have been judged to have no effect on cultural resources.

5.9 Socioeconomic Factors

The proposed project will have no adverse impact on social and economic infrastructure in the project area and vicinity. Minor beneficial economic impacts from construction activities would be expected. Sand placed on the beach at Dam Neck may eventually spread to adjacent public/private beach areas, thus slowing beach loss in these areas.

The large amount of truck traffic will be concentrated along General Booth Boulevard and Dam Neck Road to the construction site at Dam Neck. General Booth Boulevard currently has a large amount of truck traffic from the local borrow pits near Pungo just to the south of Dam Neck. Dam Neck Boulevard and the roads within Dam Neck will experience a large increase in truck traffic during the day for up to 80

days. The construction period may be less than the maximum, which will lessen impacts. Local access problems and the potential for increased fugitive dust from blowing sand may result. During a portion of the construction period, the base housing area between the BOQ and the Weapons Facility would have construction activity on both sides. Truck traffic would occur landward of the area and dune construction would occur seaward of the same area.

Recreational boating would be restricted in the dredging and construction area. Ocean waters near Dam Neck are currently restricted during training operations. Boats may pass when the area is not being used. Depending on the type of dredge used for beach nourishment, a closed area due to construction activities may be necessary either from the beach to approximately 500 meters (1640 feet) offshore for a hopper dredge to 5 kilometers (3 miles) offshore in the case of a hydraulic dredge. The pipeline would be submerged for part of this distance, to provide passage for smaller coastal craft. This would eliminate the need for small craft to travel a significant distance seaward as they proceed along the coast in this area. The possibility of small craft mishap would be reduced, since the ability of some of the recreational watercraft to operate more than several hundred meters from shore is questionable. A "Notice to Mariners" would be issued for any nearshore dredging operations.

5.10 Floodplain Management and Development

Due to the purpose of the project to protect structures prone to erosion and storm damage, the project must be in the proposed location. The effect of the proposed project on the 100 year flood plain is expected to be minor, an existing dune system will be rebuilt and the beach nourishment portion of the project will prevent dune failure. The project will not increase or reduce flood heights due to storm surges, which are the main cause of flooding in this area. The project will provide additional protection to structures from storm surge and high wave flooding.

6. COORDINATION

This document or portions pertinent to agency areas of responsibility were either discussed with or sent to the following:

- Commonwealth of Virginia State Historic Preservation Office,
- Virginia Field Office, US Fish and Wildlife Service,
- National Marine Fisheries Service
- Minerals Management Service, US Department of the Interior,
- Norfolk District, US Army Corps of Engineers,

7. MITIGATION MEASURES

The sand dredging and beach nourishment would not be conducted in a manner to conflict with the movement and potential nesting of loggerhead turtles in the vicinity of the project area. The time period June through August would be used as the interval during which beach surveys would be conducted prior to fill or beach disturbing construction activities. Areas which indicate Loggerhead turtle nesting activity will be closed to all construction activities until the presence of a nest can be confirmed and the eggs moved to a safer location. The sand dredging operation may require dredging operations during June through August. Coordination with the National Marine Fisheries Service is underway to address the potential for impacts to the threatened loggerhead sea turtle (Caretta caretta) and the endangered Kemp's ridley (Lepidochelys kempi), green (Chelonia mydas) and leatherback (Dermochelys coriacea) sea turtles, as well as fin (Balaenoptera physalus), humpback (Megaptera novaengliae), and right (Eubalaena glacialis) whales.

In order to reduce the potential for adverse effects on protected species, the following mitigation measures are being studied:

- The use of a hydraulic dredge rather than a hopper dredge to dredge the offshore borrow area would be specifically addressed by the Navy.
- If a hopper dredge is used, NMFS approved observers would be used once surface water temperatures reached 20°C or by May 15 (whichever comes first) through November 30 of the project year. Weekly summary reports would be submitted to the Northeast Region by the observers.
- The hopper dredge would be equipped with screening in order to monitor intake and overflow for turtles or turtle remains.
- A report summarizing the results of the dredging and sea turtle take would be submitted by the observers to the Navy and NMFS within 15 days of project completion.

The reconstructed sand dune would be planted to stabilize the dune and provide additional nearshore habitat. Six dune crossing bridges would be constructed to prevent dune disturbance after construction and planting of the dune.

8. CUMULATIVE ENVIRONMENTAL IMPACTS

Two projects dealing with beach nourishment on the Atlantic shore in Virginia are planned. One is the placement of approximately 743,000 cubic meters (972,000 cubic yards) of sand on Sandbridge Beach. This area is immediately to the south of FCTCLANT Dam Neck. This project calls for the placement of sand on 8 kilometers (5 miles) of the Atlantic shore. Sand would be obtained from an open ocean site approximately 4.8 kilometers (3 miles) east of Sandbridge Beach. This site is the same location proposed as the sand source for the Dam Neck beach nourishment

Unit I). Project maintenance material will presumably be dredged from Unit I as well. The second project is the nourishment of approximately 1.6 kilometers (1 mile) of beach seaward of the City of Virginia Beach's resort strip. No date or sand source for this project has been specified as yet. These projects will occur in different calendar years, thus allowing the natural system to adjust to the new beach areas.

The potential exists for the disturbance or inadvertent taking of protected species due to this project. Such taking would adversely effect the recovery of these species along the East Coast of the US. The preventative actions to be taken as part of this project and the dispersed distribution of the sea turtles make the potential for this disturbance or taking low.

9. CONCLUSION

The impacts of the proposed government preferred alternative on the environment would not be significant in the short term and would have no long term adverse environmental effects. This is contrasted against the increased level of storm protection given structures essential to the continued operation of the Fleet Combat Training Center Atlantic at Dam Neck.

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12. INDEX

—A—

Air Quality, 23
Air Quality impacts, 27
Alternatives, 11

—B—

Beach, 16
Beach Replenishment Areas, 19, 25
beach restoration, 9, 17
Borrow Areas, 19, 25

—C—

Conclusion, 31
Construction Alternatives, 11
Coordination of the EA, 29
Core-Loc Seawall, 14
Correspondence, 41
Cultural Resource impacts, 28
Cultural Resources, 23
Cumulative effects, 30

—D—

Dune construction, 16

—E—

ENVIRONMENTAL CONSEQUENCES, 25
Evaluation, 11
Evaluation Factors, 11

—F—

Floodplain impacts, 29
Floodplain issues, 25
Flora, 37

—G—

Gapped breakwater, 13

—H—

Hydrology, 19
Hydrology impacts, 25

—I—

Letter from NMFS of June 16, 1995, 49
Letter to FWS of 30 May 1995, 43
Letter to NMFS of 30 May 1995, 46
Letter to NMFS of 5 July 1995, 51

—M—

Mitigation, 30

—N—

No Action Alternative, 11

—P—

Permits, 9
PREPARERS, 34
Project, 5
Project Design, 6
Project Location, 6
Project Need, 5
Proposed Action Description., 6

—R—

Recreational boating, 29
REFERENCES, 32

—S—

Sand sources, 17
Sandbags, 13
sea turtles.
Seawall, 14
SHPO Letter of July 25, 1990, 42
Socioeconomic Description, 24
Socioeconomic impacts, 28
Soils description, 18
Soils impacts, 25

—T—

Threatened and Endangered Species, 22
Threatened and Endangered Species impacts,
26
Truck traffic effects, 28

—V—

Vegetation, 22
Vegetation impacts, 26

—W—

Wetland impacts, 25
Wetlands, 19
whales.
Wildlife, 22
Wildlife impacts, 26

APPENDIX A Common Project Area Flora and Fauna

Table A1 Common Project Area Vegetation

Common name	Scientific name
American beachgrass	<i>Ammophila breviligulata</i>
Sea oat	<i>Uniola paniculata</i>
Spike grass	<i>Distichlis spicata</i>
Seaside wild rye	<i>Elymus virginicus</i>
White willow	<i>Salix alba</i>
Sea rocket	<i>Cakile edentula</i>
Seaside goldenrod	<i>Heterotheca pinifolia</i>
Sandspur	<i>Cenchrus tribuloides</i>
Sandbur	<i>Cenchrus longispinus</i>
Common trumpet creeper	<i>Compsis radicans</i>
Riverbank grape	<i>Vitis riparia</i>
Red bay	<i>Persea borbonia</i>
Spanish bayonet	<i>Yucca aloifolia</i>
Live oak	<i>Quercus virginiana</i>
Sea ox-eye	<i>Borrichia frutescens</i>
Orach	<i>Atriplex patula</i>
Marsh-elder	<i>Iva frutescens</i>
Marsh-elder	<i>Iva imbricata</i>
Groundsel tree	<i>Baccharis halimifolia</i>

Table A2 Common Beach and Nearshore Wildlife

Common name	Scientific name
Ghost crab	<i>Ocypode albicans</i>
Mole crab	<i>Emerita talpoida</i>
Blue crab	<i>Callinectes sapidus</i>
Hermit crab	<i>Pagurus</i> sp.
Cancer crab	<i>Cancer</i> sp.
Calico crab	<i>Ovalipes ocellatus</i>
Razor clam	<i>Ensis directus</i>
Coquina	<i>Donax varabilis</i>
Amphipod	<i>Haustorius arenarius</i>
Sand worm	<i>Clymenella torquata</i>
Sand worm	<i>Diopatra cuprea</i>
Sand worm	<i>Nereis grayi</i>
Common squid	<i>Loligo pealei</i>
Smooth dogfish	<i>Mustelus canis</i>
Spiny dogfish	<i>Squalus acanthias</i>
Dusky shark	<i>Carcharhinus obscurus</i>
Sandbar shark	<i>Carcharhinus milberti</i>

Sand tiger shark	<i>Odontaspis taurus</i>
Atlantic angel shark	<i>Squatina dumerili</i>
Winter skate	<i>Raja ocellata</i>
Clearnose ray	<i>Raja eglanteria</i>
Smooth butterfly ray	<i>Gymnura micrura</i>
Cownose ray	<i>Rhinoptera bonasus</i>
American eel	<i>Anguilla rostrata</i>
Atlantic menhaden	<i>Brevoortia tyrannus</i>
Bay anchovy	<i>Anchoa mitchilli</i>
Oyster toadfish	<i>Opsanus tau</i>
Goosefish	<i>Lophius americanus</i>
Spotted hake	<i>Urophycis regius</i>
Halfbeak	<i>Hyporhamphus unifasciatus</i>
Atlantic needlefish	<i>Strongylura marina</i>
Mummichog	<i>Fundulus heteroclitus</i>
Striped killifish	<i>Fundulus majalis</i>
Atlantic silverside	<i>Menidia menidia</i>
White perch	<i>Morone americana</i>
Striped bass	<i>Morone saxatilis</i>
Black sea bass	<i>Centropristes striata</i>
Bluefish	<i>Pomatomus saltatrix</i>
Pigfish	<i>Orthopristis chrysoptera</i>
Pinfish	<i>Lagodon rhomboides</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Spot	<i>Leiostomus xanthurus</i>
Inshore lizardfish	<i>Synodus foetens</i>
Silver perch	<i>Bairdiella chrysura</i>
Red drum	<i>Scianops ocellata</i>
Atlantic croaker	<i>Micropogon undulatus</i>
Southern kingfish	<i>Menticirrhus americanus</i>
Northern kingfish	<i>Menticirrhus saxatilis</i>
Spotted sea trout	<i>Cynoscion nebulosus</i>
Weakfish	<i>Cynoscion regalis</i>
Northern stargazer	<i>Astroscopus guttatus</i>
Northern puffer	<i>Sphoeroides maculatus</i>
King mackerel	<i>Scomberomorus cavalla</i>
Spanish mackerel	<i>Scomberomorus maculatus</i>
Little tunny	<i>Euthynnus alletteratus</i>
Butterfish	<i>Peprilus triacanthus</i>
Northern searobin	<i>Prionotus carolinus</i>
Atlantic moonfish	<i>Vomer setapinnis</i>
Lookdown	<i>Selene vomer</i>
Florida pompano	<i>Trachinotus carolinus</i>

Silver hake	<i>Merluccius bilinearis</i>
Summer flounder	<i>Paralichthys dentatus</i>
Winter flounder	<i>Pseudopleuronectes americanus</i>
Windowpane	<i>Scophthalmus aquosus</i>
Hogchoker	<i>Trinectes maculatus</i>
Blackcheek tonguefish	<i>Syphurus plagiusa</i>

Table A3 Common Beach and Nearshore Wildlife

Common name	Scientific name
Herring gull	<i>Larus argentatus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Bonaparte's gull	<i>Larus philadelphicus</i>
Laughing gull	<i>Larus atricilla</i>
Great black-backed gull	<i>Larus marinus</i>
Sanderling	<i>Crocethia alba</i>
Eastern brown pelican	<i>Pelecanus occidentalis carolinensis</i>
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
Raccoon	<i>Procyon lotor</i>

APPENDIX B Correspondence



COMMONWEALTH of VIRGINIA

Department of Historic Resources

221 Governor Street

Richmond, Virginia 23219

Hugh C. Miller, Director

TOE (804) 786-1934
Telephone (804) 786-3712
FAX (804) 229-1281

MEMORANDUM

DATE: July 25, 1990

DHR file #: 90-286-F

TO: Mr. Bert W. Parelari, Jr.

FROM: Elizabeth P. Hage, Review and Compliance Officer:
Architecture

EPE Ethel Eaton, Review and Compliance Officer:
Archaeology

Mary Harding Sadler, Historical Architect

PROJECT: VMRG Project No. 90-0474-6

LOCATION: Virginia Beach, Virginia

The Department of Historic Resources has completed its review of the Phase 1 archeological survey report on the above project. No further archeological investigations are warranted.

There are no properties that are listed or eligible for listing in the National Register of Historic Places that may be affected by this project. You have met the requirements of Section 106 of the National Historic Preservation Act as per 36 CFR 800.

X The proposed project will have no effect on properties that are listed or eligible for listing in the National Register of Historic Places. You have met the requirements of Section 106 of the National Historic Preservation Act as per 36 CFR 800.

The proposed project will have no adverse effect on properties that are listed or eligible for listing in the National Register of Historic Places. Please be advised that as per 36 CFR 800.3(d), in cases where the effect of a project is not considered adverse, you are required to notify the Advisory Council on Historic Preservation and submit summary documentation for their review.

cc: Bruce F. Williams

804 322-4889

2032JH
11000

Ms. Karen Mayne
Supervisor
Virginia Field Office
US Fish and Wildlife Service
White Marsh, Virginia 23183

30 MAY 1995

Dear Ms. Mayne,

The Atlantic Division, Naval Facilities Engineering Command is currently preparing an environmental assessment for the construction of a reinforced sand dune and beach nourishment at the Fleet Combat Training Center Atlantic, Dam Neck, Virginia Beach, Virginia. Enclosed are several illustrations showing the location of the project. Also enclosed is a description of the preferred alternative.

I also reference your 13 March 1992 letter to Col. Richard Johns of the Norfolk District, Corps of Engineers concerning a similar project at Sandbridge Beach which is located immediately to the south of Dam Neck. The concerns you raise in your letter will be addressed in the project environmental assessment.

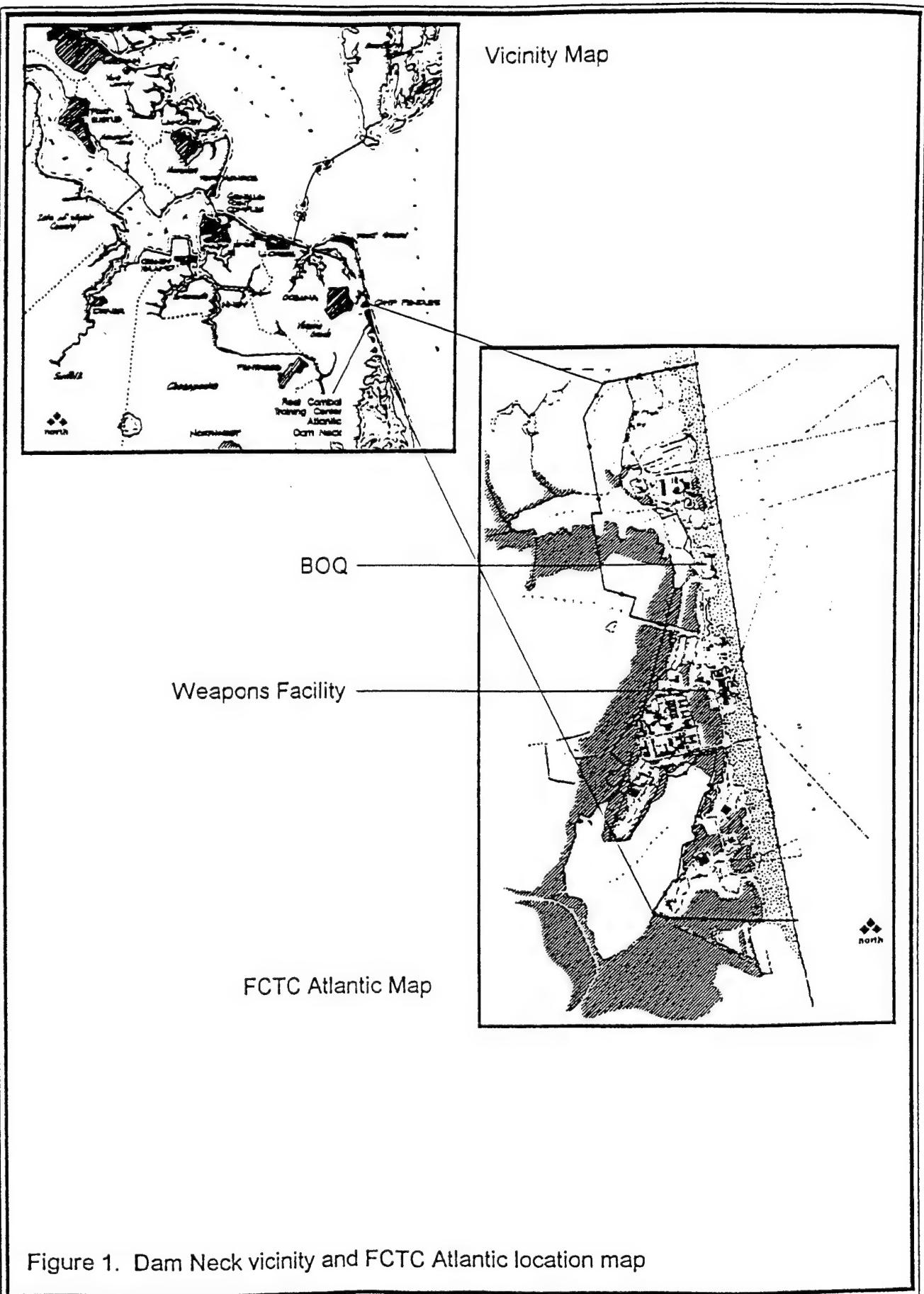
I am requesting your preliminary comments concerning both the project in general and its potential environmental effects, as well as potential impacts of the project on endangered species. Any views you might have on ways to reduce or eliminate these impacts would be appreciated.

Your input by 16 June 95 would be helpful in allowing us to maintain the project schedule. The Navy would like to begin construction of the reinforced sand dune portion of the project this calendar year.

The Navy point of contact for the EA is Mr. James Haluska. He can be reached at (804) 322-4889 or FAX (804) 322-4894.

Copy to:
Code 0311A
Code 2031

Valerie W. Hilliard, RLA
Natural/Cultural Resources
By direction of the Commander



Project Design

The government preferred plan specifies the construction of a 1,610 meter long reinforced sand dune from approximately 180 meters north of the Bachelor Officer's Quarters (BOQ) to approximately 300 meters south of the Training Complex. The reinforced dune will consist of two sections with a natural stone core 11.3 meters wide by 2.7 meters high from the base of the lower level to the top of the higher level. The two sections would consist of one 290 meter long section seaward of the BOQ and a 670 meter long section seaward of the Enlisted Men's Club and the Training Complex. The stone work will then be covered by a 30 meter wide by 3.7 meter high sand dune. The dune will be continuous from south of the Training Complex to north of the BOQ. Sand for the proposed dune will be truck hauled to the site. Approximately 88,000 cubic meters of sand would be required for the sand dune reconstruction. The dune is expected to cover approximately 4.53 hectares of near shore upland area. Three bridges over the dune would be included in the project.

The beach restoration portion of the project calls for the placement of approximately 520,000 cubic meters of sand along the Dam Neck beach in front of the reinforced sand dune. The restoration fill would cover approximately 1.8 hectares of near shore upland area, 3.2 hectares of intertidal area , and 11.3 hectares of nearshore area below the mean low water line.

804 322-4889

2032JH
11000

Mr. Christopher Mantzaris
Habitat and Protective Resources Division
1 Blackburn Drive
Gloucester, MA 01930-2298

30 MAY 1995

Dear Mr. Mantzaris,

The Atlantic Division, Naval Facilities Engineering Command is currently preparing an environmental assessment for the construction of a reinforced sand dune and beach nourishment at the Fleet Combat Training Center Atlantic, Dam Neck, Virginia Beach, Virginia. Enclosed are several illustrations showing the location of the project. Also enclosed is a description of the preferred alternative.

I also reference the 3 March 1992 letter from Mr. Timothy E. Goodger of the Oxford Laboratory to Col. Richard Johns of the Norfolk District, Corps of Engineers concerning a similar project at Sandbridge Beach which is located immediately to the south of Dam Neck. The concerns raised in that letter will be addressed in the project environmental assessment (EA).

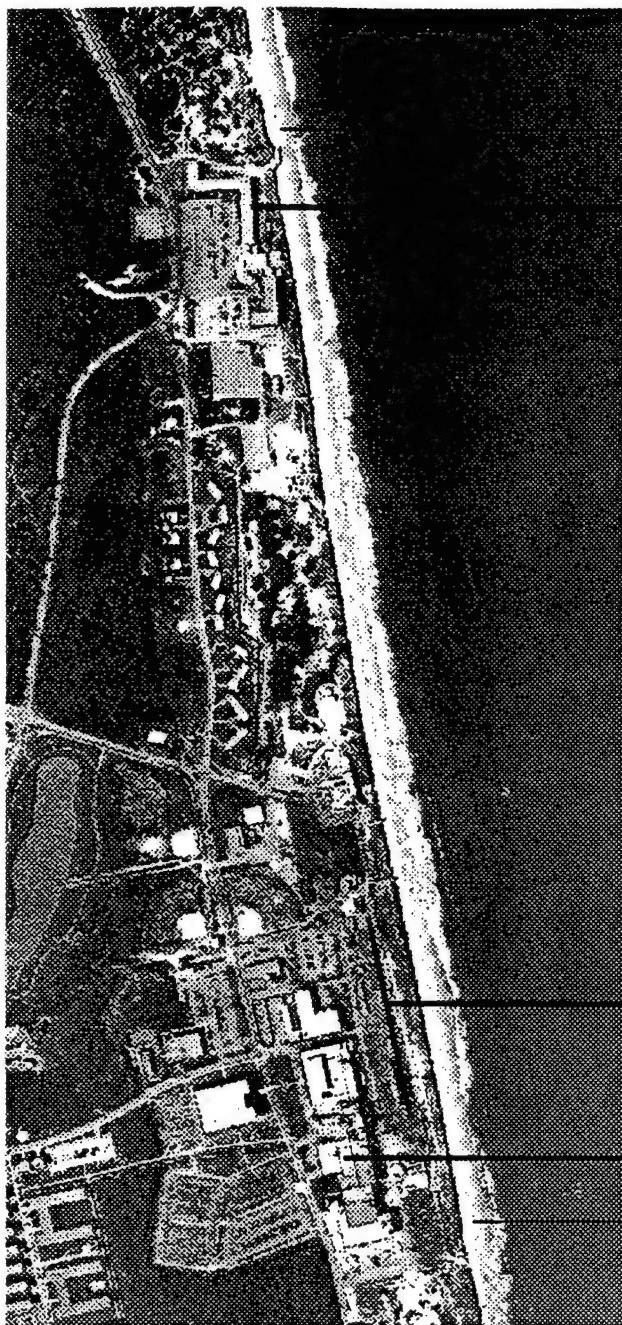
I am requesting your preliminary comments concerning both the project in general and its potential environmental effects, as well as potential impacts of the project on endangered species under your jurisdiction. Any views you might have on ways to reduce or eliminate these impacts would be appreciated.

Your input by 16 June 95 would be helpful in allowing us to maintain the project schedule. The Navy would like to begin construction of the reinforced sand dune portion of the project this calendar year.

The Navy point of contact for the EA is Mr. James Haluska. He can be reached at (804) 322-4889 or FAX (804) 322-4894.

Copy to:
Code 0311A
Code 2031

Valerie W. Hilliard, RLA
Natural/Cultural Resources
By direction of the Commander



BOQ

Approximate Limits of Project

Gunline Area

Weapons Facility

Project Design

The government preferred plan specifies the construction of a 1,610 meter long reinforced sand dune from approximately 180 meters north of the Bachelor Officer's Quarters (BOQ) to approximately 300 meters south of the Training Complex. The reinforced dune will consist of two sections with a natural stone core 11.3 meters wide by 2.7 meters high from the base of the lower level to the top of the higher level. The two sections would consist of one 290 meter long section seaward of the BOQ and a 670 meter long section seaward of the Enlisted Men's Club and the Training Complex. The stone work will then be covered by a 30 meter wide by 3.7 meter high sand dune. The dune will be continuous from south of the Training Complex to north of the BOQ. Sand for the proposed dune will be truck hauled to the site. Approximately 88,000 cubic meters of sand would be required for the sand dune reconstruction. The dune is expected to cover approximately 4.53 hectares of near shore upland area. Three bridges over the dune would be included in the project.

The beach restoration portion of the project calls for the placement of approximately 520,000 cubic meters of sand along the Dam Neck beach in front of the reinforced sand dune. The restoration fill would cover approximately 1.8 hectares of near shore upland area, 3.2 hectares of intertidal area , and 11.3 hectares of nearshore area below the mean low water line.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

JUN 16 1994

Mr. James Haluska
Department of the Navy
Atlantic Division
Naval Facilities Engineering
Command
1510 Gilbert St.
Norfolk, Virginia 23511-2699

Dear Mr. Haluska:

Re: Construction of a reinforced sand dune and beach nourishment
at Fleet Combat Training Center Atlantic, Dam Neck, Virginia
Beach, Virginia

The Navy proposes to construct an artificial dune with riprap core and replenish 5,280 feet of beach with approximately 350,000 cubic yards of sand. The proposed beach will extend 250 feet channelward of the existing mean low water line. The stated purpose of the project is to replenish the severely eroded dune and beach system along the Naval facility.

Based on information obtained from the Shoreline Erosion Advisory Service (SEAS) concerning beach processes at the project site, we are concerned that the proposed riprap core could be impacted from northeastern storms, resulting in dispersion of the core, if the sand (dune) cover cannot be maintained. We recommend the use of a full buried toe riprap structure for better core stability should major storms occur.

We also recommend the use of the 3 mile borrow site only as a sand source. Both the 1 and 2 mile sites are covered by finer overburdens. Their use would cause unnecessary resuspension of the fines.

The listed species under the jurisdiction of the National Marine Fisheries Service (NMFS) that may occur in the area include the threatened loggerhead sea turtle (Caretta caretta) and the endangered Kemp's ridley (Lepidochelys kempi), green (Chelonia mydas) and leatherback (Dermochelys coriacea) sea turtles, as well as fin (Balaenoptera physalus), humpback (Megaptera novaengliae) and right (Eubalaena glacialis) whales.

Sea turtles may be present in coastal Virginia waters from late spring through fall. Humpback, right and fin whales may occur in the coastal waters of Virginia from January through March, and may be in the project area or in waters immediately adjacent to

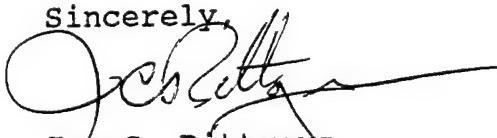


them. Recent information has shown that some juvenile humpback whales remain in Virginia waters throughout the winter months.

Hopper dredges are proposed for this project and they are known to lethally entrain sea turtles. While whales would not be directly affected by dredging operations, transit of vessels to and from the disposal site could result in vessel collisions. Therefore, consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA) should be initiated.

If you would like to discuss this matter further, please contact John C. Stremple at (410) 226-5771. For Section 7 information and protected species issues, please contact Laurie Silva at (508) 281-9291.

Sincerely,



Jon C. Rittgers
Acting Regional Director



DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1510 GILBERT ST
NORFOLK VA 23511-2699

TELEPHONE NO:

804 322-4889
IN REPLY REFER TO:

2032JH
11000

Dr. Andrew A. Rosenberg
Acting Regional Director
Northeast Region
National Marine Fisheries Service
1 Blackburn Drive
Gloucester, MA 01930-2298

07 JUL 1995

Dear Dr. Rosenberg,

In response to a letter dated June 16, 1995 from Acting Regional Director Jon Rittgers, this letter serves to initiate formal Section 7 consultation on proposed dredging at an offshore sand borrow area and transportation of the dredged sand to a beach replenishment site at Dam Neck, Virginia Beach, Virginia. The proposed dredging activity is located at the same offshore site proposed for use by the Norfolk District, Corps of Engineers and described in your biological opinion dated April 2, 1993, and is essentially identical except for differences detailed in the following paragraph.

The dredging/beach nourishment proposed by the Navy at Dam Neck would require an initial 580,000 cubic meters (760,000 cubic yards) of sand along the Dam Neck beach in front of the reinforced sand dune. The area of beach nourishment would be 2,800 meters long (9,280 feet). The beach would be maintained on a 12 year cycle with approximately 485,500 cubic meters (635,000 cubic yards) of beach quality sand.

I have enclosed a copy of the Prefinal Environmental Assessment (EA) for this project. This document should supply any additional details you may need for the biological opinion for the Navy use of the borrow area and subsequent beach nourishment. The EA includes a description of the project, characterization of the impacted area, and threatened and endangered species which may be impacted by the action.

Based on the information presented in the EA regarding the likelihood of the presence of threatened and endangered species in the area, as well as the proposed mitigation measures, we request your biological opinion that the proposed project will not jeopardize the continued existence of the threatened loggerhead sea turtle (Caretta caretta) and the endangered Kemp's ridley (Lepidochelys kempi), green (Chelonia mydas) and leatherback (Dermochelys coriacea) sea turtles, as well as fin (Balaenoptera physalus), humpback (Megaptera novaengliae), and right (Eubalaena glacialis) whales.

This project is an Emergency Military Construction Project. Because of the urgent need to provide some protection to threatened facilities along the Dam Neck shoreline, the Navy plans to award the reinforced sand dune portion of the project as soon as possible.

We will be in a position to award this part of the work as early as July 31, 1995 if the necessary environmental documentation and consultation is completed. Therefore, your expedited review of this action would be greatly appreciated.

The referenced letter also commented on the design of the armored stone core to be covered by the proposed sand dune. The beach/dune/buried seawall system is designed to act as a complete unit. The Navy has committed to maintain both the beach and the dune system to protect Navy facilities at Dam Neck. The rip-rap core is designed as a secondary defense against major storm attack. The core is designed to withstand a 1 percent chance storm event with a water level and duration sufficient to expose the core. After a storm of this intensity, any damage to the core/dune system would be repaired and not left to weather the next storm event. Under the design conditions (1 percent chance water level and wave heights) the core would not experience any significant damage and only portions of the sand dune would need to be repaired. The latest technology in coastal design and computer modeling have been employed to design this seawall system.

The Navy point of contact for the EA and consultation is Mr. James Haluska. He can be reached at (804) 322-4889 or FAX (804) 322-4894.

Sincerely,



PAMELA P. ANDERSON
Environmental/NEPA Documents Section
By direction of the Commander

Copy to (wo/encl):
Norfolk District Corps of Engineers, Regulatory Branch

U.S. Department of Interior, Minerals Management Service

DEPARTMENT OF DEFENSE
DEPARTMENT OF THE NAVY

FINDING OF NO SIGNIFICANT IMPACT FOR CONSTRUCTION OF A SEAWALL AND BEACH RESTORATION AT FLEET COMBAT TRAINING CENTER, ATLANTIC IN VIRGINIA BEACH (DAM NECK), VIRGINIA

Pursuant to Council on Environmental Quality regulations (40 CFR Parts 1500-1508) implementing the procedural provisions of the National Environmental Policy Act, the Department of the Navy gives notice that an Environmental Assessment (EA) has been prepared and that an Environmental Impact Statement is not being prepared for construction of a seawall and beach restoration at the Fleet Combat Training Center, Atlantic in Virginia Beach (Dam Neck), Virginia.

Studies and reports of consultants have shown that facilities located at the Fleet Combat Training Center, Atlantic (FCTC) are threatened by persistent beach erosion, storm surge, and high wave conditions. The proposed action is designed to eliminate or reduce the threat. There are two components to the proposed project: First, a seawall is proposed along the upland portion of the beachfront to protect existing facilities; second, beach restoration is planned to restore eroded areas and natural sand dune functions. The seawall is to be constructed of a natural stone core and covered by sand to a total height of approximately 6.7 meters (22 feet) above mean sea level. The seawall/dune will be planted with natural dune vegetation. Six pedestrian bridges will be constructed for subsequent protection of the dunes. The seawall/dune will extend 1610 meters (5280 feet) from north of the existing BOQ to south of the Training Complex. Sand for construction and maintenance of the seawall/dune will be purchased from nearby commercial upland borrow pits.

The beach restoration portion of the project comprises placement of approximately 520,000 cubic meters (680,000 cubic yards) of sand along the FCTC beachfront in front of the reinforced seawall/dune. Beach restoration will extend 2800 meters (9280 feet) and the fill will cover nearshore upland areas and intertidal areas, including approximately 11.3 hectares (27.9 acres) below the existing mean low water line. Maintenance of the beach/dune system would occur as needed, but replacement of sand could be required every 12 years. Sand for construction and maintenance of the beach restoration area is to be obtained from offshore borrow area(s), as specified by regulatory authorities.

The no-action alternative, to take no corrective action was determined unacceptable. Other alternatives considered: maintaining the current erosion control measures; constructing a gapped breakwater system; constructing a Core-loc seawall; and constructing only the reinforced seawall/dune. The proposed action was determined to fulfill the required protection of FCTC facilities, offer reasonable life-cycle costs, and also enhance the local environment.

Because the beach restoration portion of the project involves offshore dredging, protected marine species could potentially be affected. Consultation with National Marine Fisheries Service (NMFS) is currently ongoing. NMFS may request specific permit requirements and mitigation. Navy has consulted with all appropriate Federal, State and local agencies and necessary permits and certifications will be acquired prior to implementing the project. According to State of Virginia policy, the project will be consistent with the State Coastal Zone Program when all applicable permits are acquired. With NMFS incidental "take" limits and mitigation requirements established for the beach restoration portion of the project, environmental impacts resulting from implementing the proposed action will not be significant.

No threatened, endangered, or protected species would be affected by the reinforced seawall/dune portion of the project. The proposed action will not affect any historic or cultural resources listed on, or eligible for listing on, the National Register of Historic Places. No increase in personnel is associated with the proposed action. Traffic may be affected during construction activities, but impacts will be localized and temporary in duration. The proposed action will not affect the social or economic structure of the community. Navy will issue a "Notice to Mariners" prior to offshore dredging operations if boating activities are restricted in affected areas.

FCTC is located in an area designated as attainment for all criteria air pollutants except ozone which is in marginal non-attainment. Potential emissions of the ozone precursors NOx and VOCs were analyzed as required by the General Conformity Rule and were found to be clearly below de minimis levels. The project will therefore conform to the State Implementation Plan for air quality.

Based on information gathered during preparation of the EA and implementation of permit requirements/mitigation (including NMFS mitigation), the Navy finds that construction of a seawall and beach restoration at the Fleet Combat Training Center, Atlantic in Virginia Beach (Dam Neck), Virginia will not significantly impact the environment.

The EA addressing this action may be obtained from: Commanding Officer, Atlantic Division, Naval Facilities Engineering Command, 1510 Gilbert Street, Norfolk, VA 23511-2699 (Attn: Mr. James Haluska, Code 2032JH), telephone (804) 322-4889. A limited number of copies of the EA are available to fill single copy requests.

4 August 1995

Date

Thomas J. Peeling

Thomas J. Peeling
Special Assistant for Environmental Planning
Shore Activities Division
Deputy Chief of Naval Operations (Logistics)